



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,037	03/02/2004	Yoshimi Takahashi	TI-37029 (032350.B586)	1260
23494	7590	05/12/2006	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			DUONG, KHANH B	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	
			2822	

DATE MAILED: 05/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PD

<b>Office Action Summary</b>	<b>Application No.</b> 10/791,037	<b>Applicant(s)</b> TAKAHASHI, YOSHIMI	
	<b>Examiner</b> Khanh B. Duong	<b>Art Unit</b> 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 is/are allowed.
- 6) ☒ Claim(s) 1,5-7 and 12 is/are rejected.
- 7) ☒ Claim(s) 2-4 and 8-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Election***

Applicant's election of claims 1-12 and 20 in the reply filed on January 23, 2006 and February 3, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Furthermore, claims 13-19 were canceled and claims 1-5 and 9-11 were amended.

Currently, claims 1-12 and 20 remain pending.

### ***Claim Objections***

Claim 5 is objected to because of the following informalities: lines 4-5, "the particular mold block" (emphasis added) is inconsistent and should be "the mold block".

Claim 10 is objected to because of the following informalities: line 5, after "die structure", "toward to cause" (emphasis added) is unclear and should be deleted.

Claim 20 is objected to because of the following informalities: line 4, "the particular mold block" (emphasis added) is inconsistent and should be --a particular mold block--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ross (U.S. Patent No. 4,872,825).**

Re claim 1, Ross discloses in FIGs. 4-6 a compression molding method, comprising: positioning a film (between 61 and 56) adjacent a first die structure 30a such that a mold block 62 coupled to the film is located in a die cavity 60a in the first die structure 30a, the mold block 62 comprising mold compound and at least substantially holding its own shape; positioning an integrated circuit structure 22 adjacent a second die structure 30b, the integrated circuit structure 22 including one or more integrated circuit devices coupled to a substrate 20; and moving the first die structure 30a and the second die structure 30b toward each other to cause the integrated circuit structure 22 to compress the particular mold block 62 within the die cavity 60a in order to form a mold cap 112 covering at least one of the one or more integrated circuit devices.

Re claim 5, Ross expressly discloses in Figs. 5B-5D the volume of the mold block 62 is approximately equal to the volume of the die cavity 60a in the first die structure 30a such that little or no mold compound escapes from the die cavity during the compression of the mold block 62.

Re claim 6, Ross discloses the mold compound comprises a solid (glass fiber) [see col. 10, lines 31-36].

Re claim 7, Ross discloses the mold compound comprises silicon (glass fiber).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2822

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ross in view of Tsai et al. (U.S. Patent No. 6,857,865).**

Re claim 12, Ross fails to disclose wherein at least one of the width or length of the die cavity is greater than twenty times the depth of the die cavity.

Tsai et al. ("Tsai") teaches in FIG. 1 the width or length of a die cavity 200 appears to be greater than twenty times the depth of the die cavity 200 for the purpose of allowing the chips 25 mounted on a substrate 24 to be firmly supported by the mold structure without causing chip cracks during a molding process [see col. 1, lines 59-63].

Art Unit: 2822

Since Ross and Tsai are from the same field of endeavor, the purpose disclosed by Tsai would have been recognized in the pertinent prior art of Ross.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Ross as taught by Tsai because of the desirability to firmly support the chips in the mold structure without causing chip cracks during a molding process.

Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to optimize and select an appropriate width or length of the die cavity. The selection of parameters such as energy, power, concentration, temperature, time, depth, thickness, etc., would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art. "Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may be impart patentability to a process if the particular ranges claimed produce new and unexpected result which is different in kind and not merely degree from results of prior art ... such ranges are termed 'critical ranges' and the applicant has the burden of proving such criticality ... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation". *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). See also MPEP 2144.05.

*Allowable Subject Matter*

Claims 2-4 and 8-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 20 is allowed.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record, taken alone or in combination, fairly shows or suggests all the limitations as claimed.

Re claim 20, none of the prior art of record discloses the following limitations in combination with the rest of the limitations in the claim: coupling a prefabricated film roll to a film advancement apparatus, the prefabricated film roll comprising a roll of a film having a plurality of mold blocks including a particular mold block coupled thereto; using the film advancement apparatus operable to advance the film such that a mold block coupled to the film is located in a die cavity in the first die structure, the mold block comprising mold compound and at least substantially holding its own shape, the mold compound comprising a solid, a gel or a paste; wherein the die cavity is wider than the mold block in a first direction and longer than the mold block in a second direction such that one or more unfilled portions of the die cavity exist around the mold block before the mold block is compressed.

*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references disclose relevant teachings regarding compression molding of integrated circuit devices: Shimizu '984 and Slepcevic '056.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith, can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



KBD